NASA'S MISSION TO PLANET EARTH
EARTH PROBES
DATA INFORMATION SYSTEM
EOS
EARTH OBSERVING SYSTEM

Communications & Systems Management - Overview
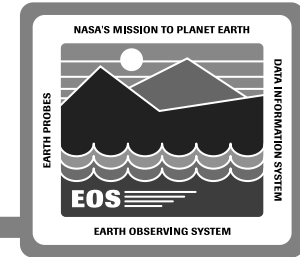
Ed Lerner
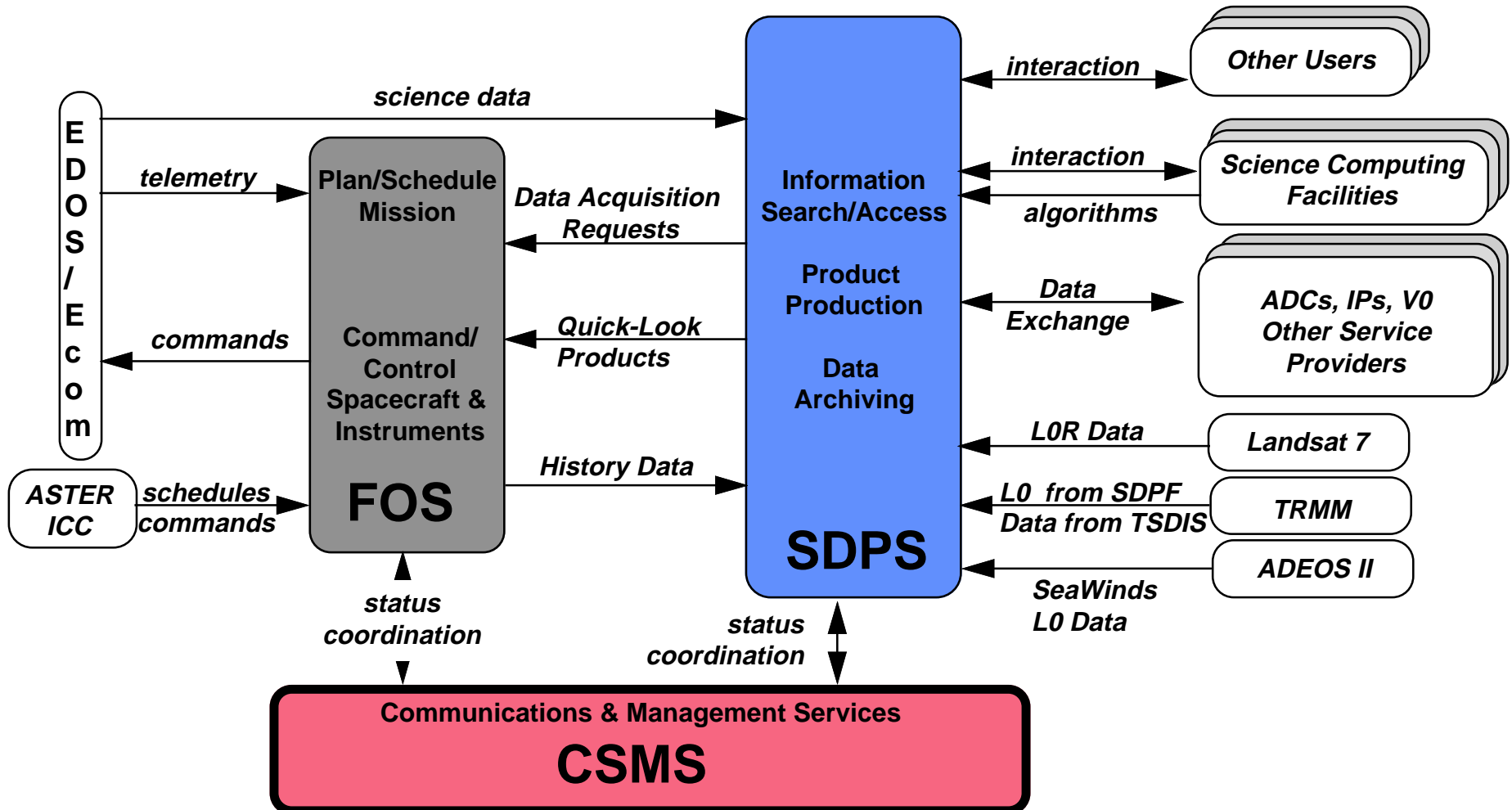
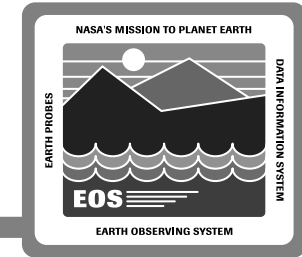### System Design Review - 27 June 1994

CSMS Outline

- **Context within ECS**
- **Mission & Key Requirements**
- **Requirements to Design Flowdown**
- **System Design Activities**
- **Changes Since SRR**
- **Position in ECS Reference Model**
- **High-Level Architecture**
- **Splinter Session Road Map**

CSMS Context Within ECS

NASA'S MISSION TO PLANET EARTH

EARTH PROBES

DATA INFORMATION SYSTEM

EOS

EARTH OBSERVING SYSTEM

E D O S / E c o m

science data

telemetry

commands

ASTER ICC

schedules commands

Plan/Schedule Mission

Command/ Control Spacecraft & Instruments

FOS

Data Acquisition Requests

Quick-Look Products

History Data

Information Search/Access

Product Production

Data Archiving

SDPS

interaction — **Other Users**

interaction

algorithms — *Science Computing Facilities*

Data Exchange — *ADCs, IPs, V0 Other Service Providers*

L0R Data — **Landsat 7**

L0 from SDPF Data from TSDIS — **TRMM**

SeaWinds L0 Data — **ADEOS II**

status coordination

status coordination

Communications & Management Services

CSMS

All interfaces use communication services provides by CSMS
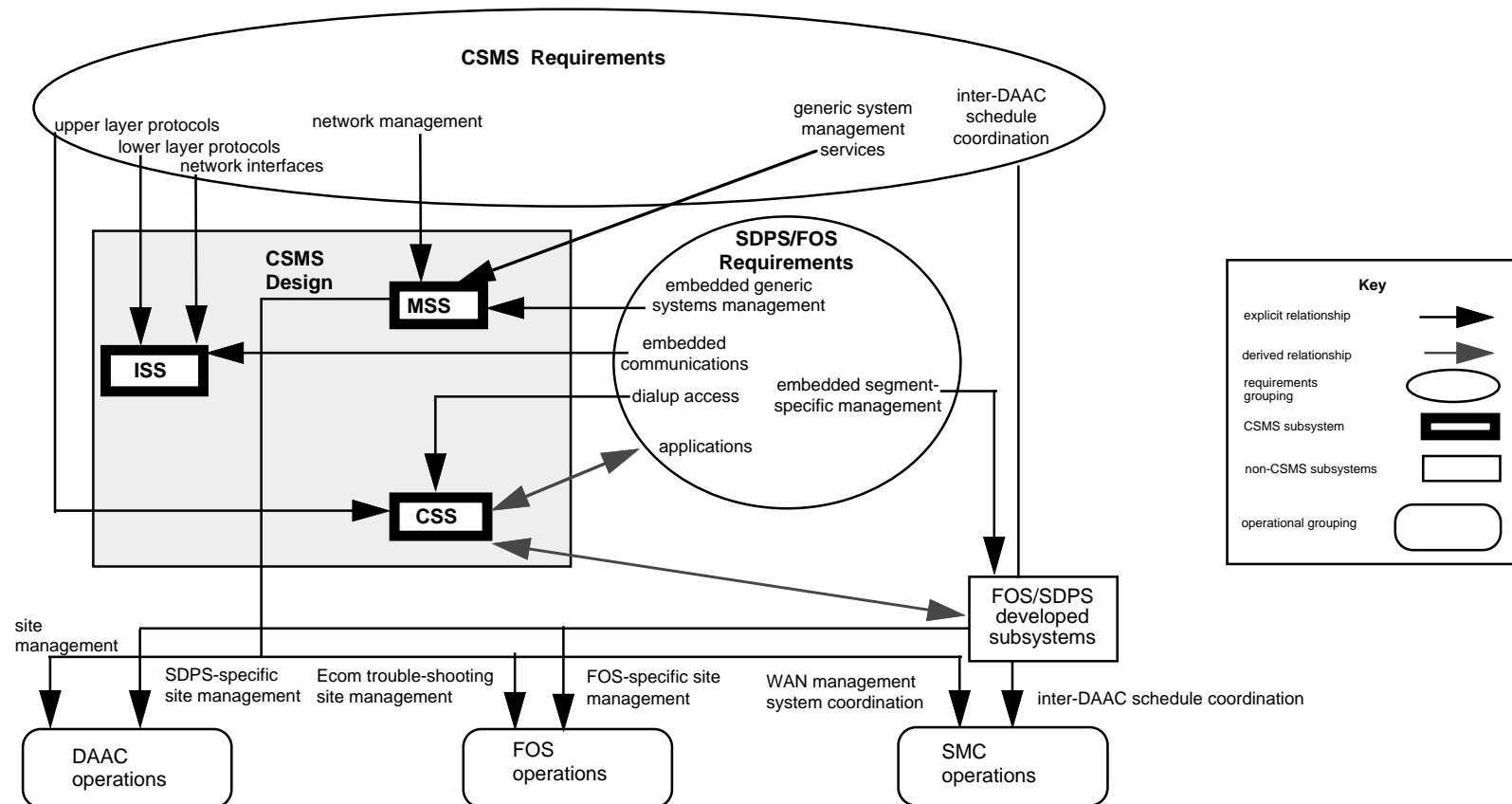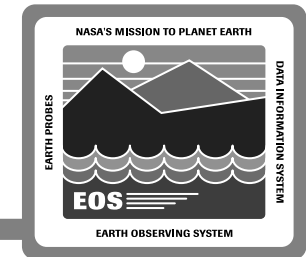
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CSMS Mission & Key Requirements

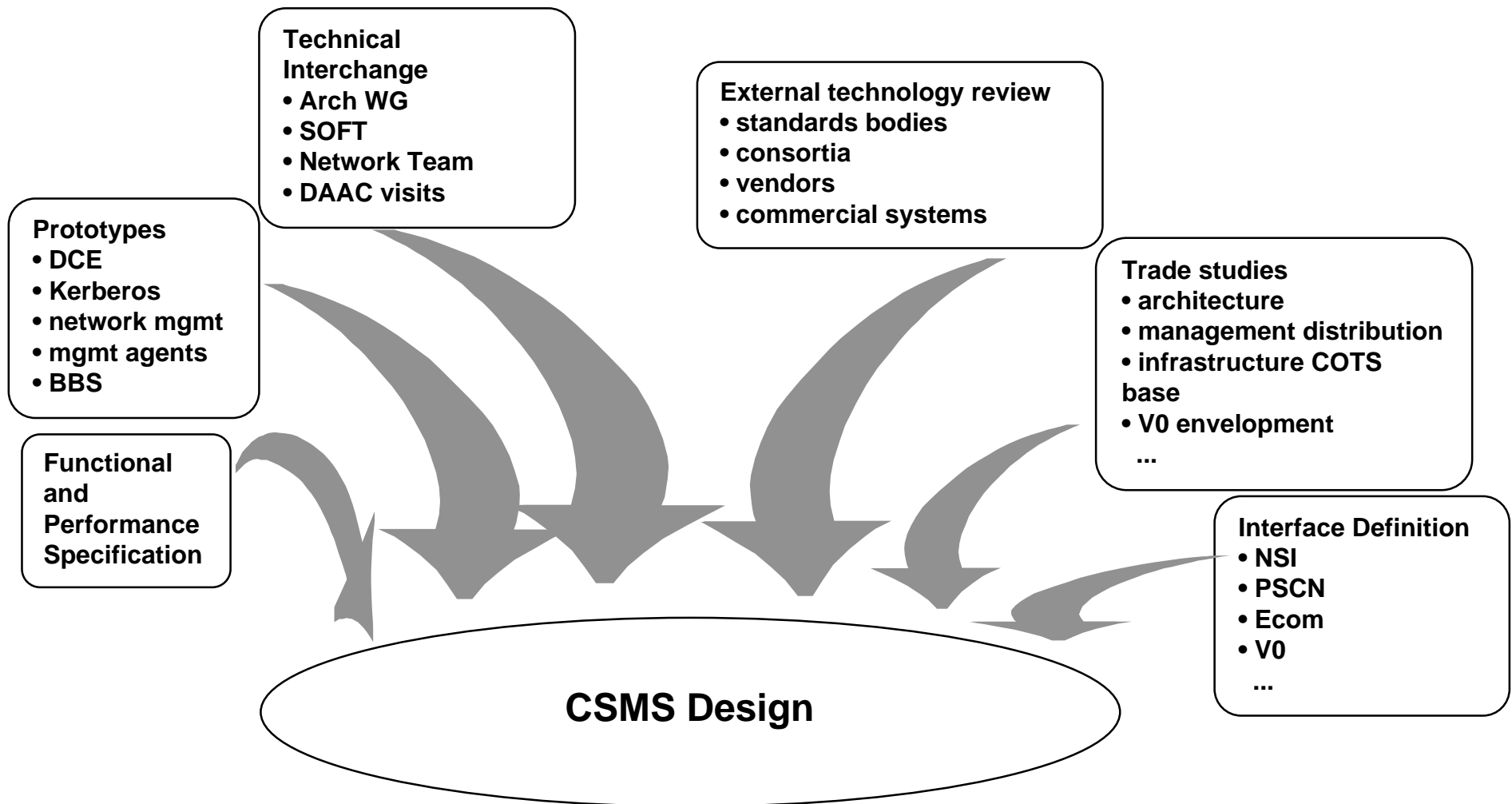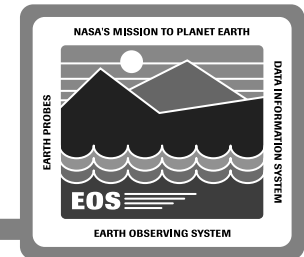CSMS is the infrastructure that interconnects and manages ECS. To accomplish its mission, CSMS:

- **Provides network connectivity/interfaces**
  - between users, DAACs, EOC, EDOS, SCFs, ADCs, EPDSs, IPs.
  - within DAACs and EOC.
- **Provides interoperability between services of FOS, SDPS, and (CSMS's own) management functions in a manner which maximizes flexibility to relocate and evolve those services.**
- **Provides management tools for the efficient and effective operation of DAACs, EOC, ESN, and interfaces with other EOSDIS components.**

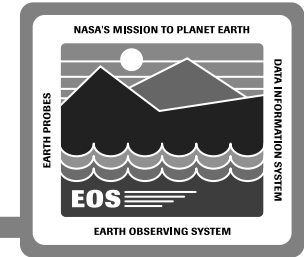These three core requirements map cleanly into three CSMS subsystems.

CSMS Requirements to Design Flowdown

NASA'S MISSION TO PLANET EARTH

EARTH PROBES

DATA INFORMATION SYSTEM

EOS

EARTH OBSERVING SYSTEM

CSMS Requirements

upper layer protocols

network management

generic system management services

inter-DAAC schedule coordination

lower layer protocols

network interfaces

CSMS Design

MSS

ISS

SDPS/FOS Requirements

embedded generic systems management

embedded communications

embedded segment-specific management

dialup access

applications

CSS

FOS/SDPS developed subsystems

site management

SDPS-specific site management

Ecom trouble-shooting site management

FOS-specific site management

WAN management system coordination

inter-DAAC schedule coordination

DAAC operations

FOS operations

SMC operations

Key

explicit relationship

derived relationship

requirements grouping

CSMS subsystem

non-CSMS subsystems

operational grouping

System Design Activities

Technical Interchange
- Arch WG
- SOFT
- Network Team
- DAAC visits

External technology review
- standards bodies
- consortia
- vendors
- commercial systems

Prototypes
- DCE
- Kerberos
- network mgmt
- mgmt agents
- BBS

Trade studies
- architecture
- management distribution
- infrastructure COTS base
- V0 envelopment
  ...

Functional and Performance Specification

Interface Definition
- NSI
- PSCN
- Ecom
- V0
  ...

CSMS Design

CSMS Changes Since SRR

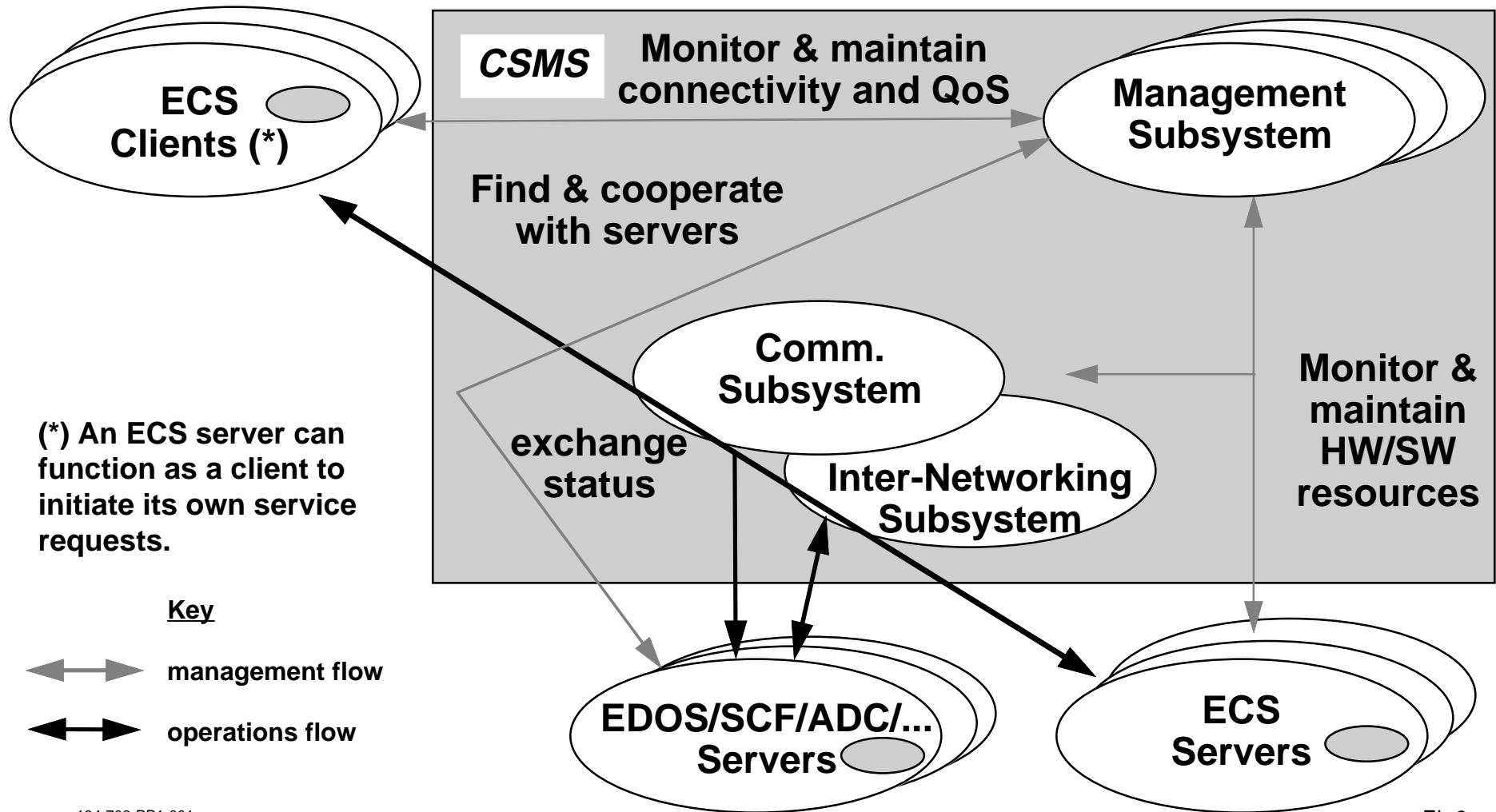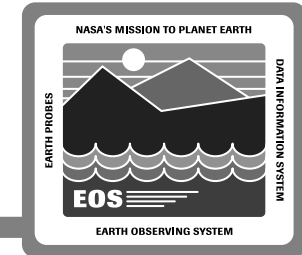| *From:*	*To:*	*Reason:*
DCE-based interoperability	**ORB-based interoperability**	**Facilitate addition of new ECS and GCDIS servers**
Network/system management	**Object management**	**Evolve to emerging industry standard**
Policy-based architecture		**Facilitate evolution; accommodate policy changes**
Hierarchical management	**Federated management**	**Avoid single point of failure; facilitate GCDIS growth**
Dedicated WAN circuits	**Bandwidth on demand**	**Reduce costs; improve QoS**

Position in ECS Reference Model

FOS Applications

SDPS Applications

CSMS Management Applications

CSMS Management Subsystem

Fault management
Performance management
Security management
Maintenance management
Report generation
etc.

CSMS Communications Subsystem

CSMS Internetworking Subsystem
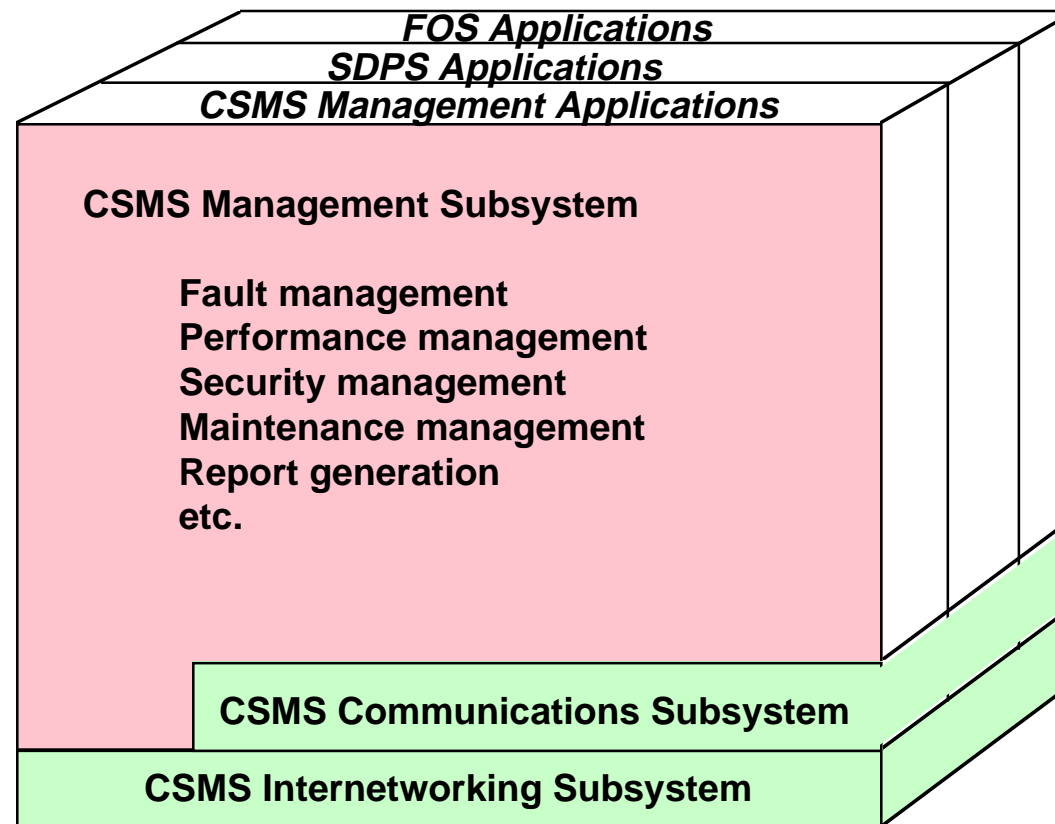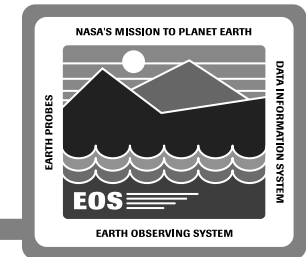
CSMS High-Level Architecture

CSMS

Monitor & maintain connectivity and QoS

ECS Clients (*)

Management Subsystem

Find & cooperate with servers

Comm. Subsystem

exchange status

Inter-Networking Subsystem

Monitor & maintain HW/SW resources

(*) An ECS server can function as a client to initiate its own service requests.

EDOS/SCF/ADC/... Servers

ECS Servers

Key

management flow

operations flow

CSMS: Splinter Session Road Map

- **Introduction**
- **Communications Subsystem**
- **CSMS Scenario**
- **Internetworking Subsystem**
- **System Management Subsystem**
- **Summary Topics**